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VOCATIONAL AND TECHNICAL EDUCATION

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VOCATIONAL AND TECHNICAL EDUCATION

Reviews the literature for the six-year period since the issuance of Vol. XX, No. 4, October 1950.

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INTRODUCTION

THE United States Census for 1950 revealed the interesting work pattern of the American people. The population of 1950 had increased some 17 percent over the 1940 population. The number of jobs had increased approximately 24 percent during this time. Increases were found in the so-called "white collar" jobs, 41 percent; manual labor jobs, such as craftsmen, operatives, and laborers, 34 percent; and service workers, 5 percent. Unskilled laborers and farm workers decreased 8 and 16 percent respectively.

One might draw the conclusion that in the years ahead more education and training of a vocational and technical nature will be necessary if the schools are to provide trained workers for an expanding economy.

This issue of the REVIEW is similar in content to the June 1947 and the October 1950 issues. The present issue contains a chapter on vocational selection. Proper vocational choice is the first fundamental for a successful program of vocational and technical education.

This issue of the REVIEW is presented with the hope that the research reviewed will help those in charge of vocational and technical education build more effective programs.

RAY BRYAN, *Chairman*
Committee on Vocational and Technical Education

CHAPTER I

Vocational Selection

CHARLES F. WARNATH

RESEARCH in the area of vocational selection does not lend itself to easy classification for several reasons. The first of these is the fact that, as Jordaan (14) has mentioned, the way in which the subjects' preferences have been elicited is not always clearly described; thus, the results of nearly identical studies may be totally different simply because the wording of the choice query, "What would you like to do for a living?" stimulates a response different from that evoked by the question, "What do you expect to be doing for a living in 10 years?" Related to this is the source of the second difficulty; namely, vocational "choice" may or may not be strictly a choice; the response with which the research worker is working may be, among other things, an aspiration, a preference, an attitude, a stated interest, a measured interest, or an actual choice. The 10-year-old boy may state an interest in becoming a doctor or may prefer engineering to auto mechanics, but he is only indirectly making a vocational selection until he can choose the training for the specific job or the job itself. As Super (42) reminds us: "The term *vocational choice*, widely used in discussions and studies of vocational development and adjustment, conveys a misleading notion of neatness and precision in time, of singleness and uniqueness in the life of the individual." The third difficulty in summarizing the research on vocational choice or selection is the apparently inexhaustible number of discrete variables which can be related to vocational choice and reported in individual articles in the journals. In a perusal of 40 or 50 reports, we find that not more than five or six seem to fall under any one general heading, with most of them distributed over a number of topics or approaches to the problem.

Because of space limitations, this summary will report only on research since 1950. During these past six years no trend is discernible in the research on vocational choice unless it is the recent emergence of a more inclusive approach to the question of choice in an attempt to formulate an over-all theory within which vocational selection can be viewed as part of a developmental process. This will be discussed in the section titled "Recent Major Projects."

Socioeconomic Status and Vocational Choice

One of the most frequently studied variables in relation to vocational selection has been social class or socioeconomic status. Galler (7), in an investigation of the answers of children in two Chicago elementary schools to the question, "What job you would like most when you grow up and why you would like it?" discovered that upper middle-class chil-

dren gave more intrinsic reasons for liking their selection and that middle-class boys gave more altruistic reasons than lower-class boys; also, significantly more middle-class boys chose their father's occupation even tho the choices of all groups ranged over all levels and kinds of jobs. Grunes (9), analyzing the ratings given 51 varied occupations by high-school students, discovered that, despite the wide agreement on job clusters, the lowest of three class groups tended to see less distinction between business and professional people while the highest group seemed to make less distinction between the various mechanical and manual jobs. Gustad (10) used the OL Scale of the *Strong Vocational Interest Blank* to measure the status aspiration of male college students and related this to the interest groups on the same test; while there were scattered significant differences in several groups, the two groups which appeared to be most consistently different were the Sub-Technical and Verbal-Linguistic. Among other things studied and reported by Hollingshead in his book, *Elmtown's Youth* (13), were the occupational choices of his 735 high-school students. He discovered that youngsters from different social classes tended to aspire to different types and levels of jobs; moreover, the percent of undecided youngsters rose as class level declined. An interview study by Kahl (15) of 24 boys from working-class families found that within this social-class level, some parents were satisfied with their own lot in life and did not attempt to push their sons up the status ladder whereas other parents clearly encouraged their sons to strive for a "better" life. Much of this article summarized that part of the extensive case material which throws light on the relationship between parental pressure and son's aspiration. Waters (47) concluded in his studies of senior boys from nine high schools that level of aspiration was much higher than was represented by the status of the family.

Using the *Kuder Preference Record* as a measure of vocational preference in a study of 485 high-school students, Moser (22) concluded that those whose parents had the greatest amount of college attendance preferred vocations which rank high in normally accepted cultural status, and that number of books in the home and number of regularly delivered magazines also correlated highly with preference. In an investigation of people in two different occupational groups (professional and nonprofessional), Norton (23, 24) discovered that vocational interests developed thruout the age span studied; however, factory workers tended to have a paucity of interest histories and were notable for their lack of vocational orientation as compared with teachers. In neither of the groups did the subjects' current vocational goals consistently reflect their earlier interests.

Special Groups and Vocational Choice

There have been a number of investigations whose common denominator has been specificity or special interest of the group studied. Harrison

(11, 12), Brown (2), and Lawrence (19) examined the vocational goals of Negro youth; McFarland, Moseley, and Fisher (21) investigated some of the questions related to becoming and persisting as a professional truck driver; Scantlebury (29) studied third- and fourth-year medical students to discover some of the factors which influence youth to study medicine; Willcox and Beigel (48) did the same for teachers. Knapp and Goodrich (17), in their book entitled *Origins of American Scientists*, reported a survey of the background of American scientists, emphasizing their undergraduate college careers. Finally, Roe (26, 27, 28) collected and presented the life history data of eminent scientists in the fields of the physical and biological sciences, anthropology, and psychology; she also reported on the results of a number of tests given to these scientists.

Follow-Up Data Used To Study Vocational Choice

Several studies using follow-up data to check on the accomplishment of original vocational plans were completed. Dickinson (3) obtained from graduating seniors at the University of Washington a 75-percent return on 2180 questionnaires requesting information concerning the type of work preferred after graduation. The survey indicated that the great shortages in the supply of trained workers for some fields, such as engineering and accounting, may be partially due to the fact that very sizable percentages of those gaining degrees in such fields of study do not choose to enter these professions upon graduation but prefer to use their training to achieve other occupational goals. In a follow-up of 1600 Pittsburgh high-school seniors one year after graduation, Latham (18) found no correlation between success or satisfaction on the job and appropriateness of the job to the aptitudes of the individual; nor was any correlation found between success or satisfaction and the extent of agreement between job planned and job taken. Neither work planned nor work selected was associated with aptitudes. Strong (39) followed up 19 years later the Stanford University freshmen of 1930 and found from 38 to 61 percent had continued in the occupation of their early choice (the discrepancy being due to whether or not "don't know" responses were included and how *business* was interpreted). Taking amount of change into account, one-half of the students continued in the occupation of their early choice or changed to an occupation closely related to it.

Personality and Vocational Choice

In the area of personality, Feather (5) studied 503 veterans using the *Minnesota Multiphasic Personality Inventory* and the *Kuder Preference Record, Vocational.* He concluded that those with personality maladjustments were more likely to have occupational interests which fell in the significant range (75th percentile or above) of the *Kuder* in the Literary, Musical, and Artistic areas. Moreover, these same maladjusted individuals

were less likely than the normal ones to have interests in the Mechanical and Scientific areas. Forer (6) examined the *Kuder Preference Records* of 24 differently diagnosed disabled veterans. Nearly all showed significantly high social service interests. One conclusion reached was that emotionally disturbed persons rejected activities in which they were most likely to succeed for those offering uncontrolled freedom in which they were most likely to fail. Levin (20) discussed ego involvement and status anxiety as they affect occupational choice.

Small (35) reported on a comparison of the vocational choices of adjusted adolescent boys with those of disturbed adolescent boys and on an examination of the reality and fantasy content of their choices. The better adjusted boys were found to deviate less from the requirements of their chosen occupations than did the disturbed boys; however, the better adjusted subjects' second choices were "less realistic" than their first choices, and the second choices of the disturbed subjects were "more realistic" than their first choices. Using Murray's needs, Small found that the better adjusted subjects showed more of the needs that are associated with environment involvement, forming relationships, and the exercise of skills and talents. The disturbed subjects showed more of the needs that are associated with environment avoidance and the restriction both of relationships and of exercise of talents. Steinberg (38) studied 150 disabled veterans to determine if there were differences in the patterns of vocational choice, as measured by the *Kuder Preference Record*, between people who used neurotic patterns of adjustment and people who were not patently neurotic. Differences between the means of the neurotic and nonneurotic groups, significant at the 1-percent level, were found on the Mechanical Scale (nonneurotic higher) and the Musical Scale (neurotic higher); a difference at the 5-percent level was found on the Literary Scale (neurotic higher). Steinberg concluded that there was a tendency for the more maladjusted to emphasize fantasy rather than practical performance and to have more unrealistic goals.

Miscellaneous Studies of Vocational Choice

Singer and Stefflre (32, 33, 34) contributed three articles to the vocational choice literature. In an interview study of 373 male and 416 female high-school seniors, the authors found that jobs offering power, profit, and independence were significantly overselected by the boys while girls were more inclined to select job values characterized by interesting experiences and social service. Studying age differences in job values and desires, the authors found that adult males were not particularly concerned with an interesting job with fame or with profit in comparison with a group of high-school seniors. On the other hand, urban adults overselected a job where you could "work more or less on your own" while the adolescents did not attach much importance to independence. Finally, a group (N=148) of male adolescents scoring in the upper quarter of

the Level of Interest Section of the *California Occupational Interest Inventory* was compared with a low-quarter scoring group (N=64) on Center's *Job Values and Desires Checklist.* A significantly greater proportion of the high-quarter group than of the low-quarter group wanted jobs permitting self-expression, and a significantly higher proportion of the low-quarter group selected the value of job independence.

Three studies concentrating on the general educational and career plans of students were carried out by Berdie (1), Ezell and Tate (4), and Stephenson (37). Berdie's book covers questionnaire and test material collected from approximately 25,000 Minnesota high-school seniors and was aimed at an over-all examination of the forces acting within and on the high-school student which direct him toward college, work, or some post-high-school training. Ezell and Tate used the questionnaires of 1572 high-school students in and around Waco, Texas, to survey the students' post-high-school plans, reasons for these plans, and family background. Stephenson obtained questionnaire data on 443 ninth-graders in a semi-industrial community of 52,000 inhabitants to study their job aspirations and family occupational background.

Several studies have been directed at the examination of change in vocational choice. Schmidt and Rothney (30) investigated the change in choices of 869 high-school students, 347 of whom received intensive counseling until graduation. The authors discovered that approximately half of the students entered the post-high-school occupation or training which they had chosen at one of their three years in high school, that approximately 2 out of 3 students changed their choice at least once during high school, and that 1 out of 5 students expressed the same choice all the way thru school and followed thru in his post-high-school vocational activity. Strong (40), following up on the occupational plans of 255 Stanford freshmen while giving them the *Strong Vocational Interest Blank,* discovered that 40 percent had changed their occupational choice by the time they were sophomores. Excluding students who chose an occupation for which there was no *Strong VIB* scale, the conclusion was that the smaller the relationship between the first and second choice, the greater the discrepancy between either choice and measured interest score. Pihlblad and Gregory (25) compared the occupations engaged in approximately 10 years after high school by a group graduating at the beginning of a depression with the occupations of a group faced with armed service and/or plentiful jobs. Definite shifts in types of jobs obtained by these groups were found; the most marked shift was a movement away from teaching.

Traphagen (46) investigated the *Strong VIB* patterns for two groups of male college students: 30 who persisted in their original choice of high-school teacher thruout counseling and 30 who changed from high-school teacher during counseling. Several definite differences in the patterns of the two groups were apparent. Speer and Jasker (36), using 107 males who sought vocational counseling, investigated the influence of

occupational information on occupational goals. They deduced that with more adequate information about themselves nearly half changed their occupational goals. Almost all those choosing "lower" goals had had original goals at the professional and semiprofessional levels.

Klare (16) found that neither mechanical work preferences nor clerical work preferences showed any significant relationship to scores on an immediate retention test covering a mechanical training lesson. Both mechanical and clerical aptitude, however, appeared quite highly and consistently related to retention test scores (this was particularly true for mechanical aptitude).

Schmidt (31), in a study of 900 tenth-grade students of four Wisconsin high schools, concluded: (a) that occupational choices of tenth-grade secondary-school subjects were more stable than previous literature in this area indicates and (b) that sophomores in high school who selected certain specific occupations tended to make scores significantly higher than average on only approximately half the tests of *Primary Mental Abilities* which purport to measure abilities required in those occupations.

Recent Major Projects

Special attention is called to several major projects which have been directed more toward the underlying theory of vocational choice than toward the examination of discrete variables related to vocational selection. The first of these, by Ginzberg and others (8), reviewed three current theories of occupational choice and presented material collected thru interviews aimed at eliciting information in each of the major areas of experience that are likely to have a significant influence on occupational choice: the self, reality, and key persons. The study concentrated on studies of individuals from the same social group but of different ages and maturity (actually, the subjects were from the more privileged upper-middle and lower-middle socioeconomic group). Findings were based on an intensive analysis of eight open-ended question interviews of individuals at each of eight stages in the educational process, starting with the sixth grade in elementary school. The focus was on the decision-making of the individual and the important factors which entered into his choice. Ginzberg arrived at the conclusion that there are three distinct periods of occupational decision-making: the period (between ages 6 and 11) during which the individual makes what can be described as a fantasy choice; the period (generally coinciding with early and late adolescence) during which he is making a tentative choice; and the period (during early adulthood) when he makes a realistic choice. These periods can themselves be broken down into several stages. The outstanding conclusion from the findings was that occupational choice is a developmental process: It is not a single decision, but a series of decisions made over a period of years. Each step in the process has a meaningful relation to those which precede and follow it. From this primary finding, there

follows a second important generalization: The process is largely irreversible. Also, the process ends in a compromise.

Following the line of reasoning, developed in several articles (41, 42, 43), that vocational choice is actually a series of choices and that the term vocational development is more appropriate, Super designed a longitudinal investigation termed the Career Pattern Study to test this choice process. This 20-year follow-up had not produced any reports (other than dissertation studies) during the period under review altho a series of monographs had been scheduled for future release. Approximately 140 boys from the eighth grade and 140 boys from the ninth grade of the Middletown, New York, junior and senior high schools were interviewed and tested in 1950-51. A battery of some 20 tests was administered and four recorded interviews were obtained from each boy concerning his in-school activities, out-of-school activities, family relationships, and plans. In addition the parents of all of the subjects were interviewed, with emphasis on their own vocational histories. When these boys became seniors, in 1954-55, they were again tested and interviewed, as were those subjects who had subsequently changed schools or dropped out of school. At intervals until they reach the age of 35, the subjects will be contacted in order to keep their life histories (especially the educational and vocational components) up to date.

An extensive investigation of career development was also under way at the Graduate School of Education at Harvard University under the general supervision of Tiedeman. The Harvard Studies in Career Development were in the main founded upon Super's proposed theory of career development. However, the studies made greater use of the structure of the American school system than did Super's approach. Seven levels of occupationally oriented choice were investigated, from the secondary school thru specific job choice. The Harvard Studies in Career Development initially attempted to ascertain whether ability patterns distinguish people choosing one option over another at any one of these choice points. Two papers on the Harvard Studies were published during the period reviewed: The first (44) examined the use of the *Differential Aptitude Test* in differentiating between pupils choosing either the high-school business curriculum or college preparatory curriculum; the second (45) presented an application of the method of discriminant analysis to data for more than two groups in the prediction of college fields of concentration.

Summary and Conclusions

It is apparent that major developmental projects have become an important factor in the field of vocational selection because of a desire to establish a theoretical framework for the study of the choice process. Previous examinations of discrete variables as they relate to *a* vocational choice have been found generally limited in their application because the

choices of the individual show change both in content and in the meaning of the term to the subjects over a period of time; thus, the results of these studies tend to be heavily loaded with a time or circumstance factor. The later studies of Ginzberg, Super, and Tiedeman approached choice thru the channel of general development. This has necessitated the study of the choice *process* for varied groups at different age and maturity levels or for a single group over an extended period of time. In either case *the* choice is not central, but what is important is the series of choices which the individual makes from secondary school thru retirement and the relation of these choices to each other and to the factors which impinge on them at each level of development.

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CHAPTER II

Agricultural Education

LLOYD J. PHIPPS

THE research reviewed in this chapter relates primarily to agricultural education provided by the public schools. Research in agricultural education was last reviewed in the October 1950 issue of the REVIEW OF EDUCATIONAL RESEARCH (60) and was first treated in the REVIEW in October 1944 (59). Since 1950 the number of studies in agricultural education has increased rapidly (2, 3, 4, 5, 6, 7). As the material for this chapter was prepared, more than 1000 studies were considered. In the selection of studies to review, the following criteria were used: (a) importance, (b) quality, (c) methodology employed, (d) significance of the findings, and (e) accessibility of the study.

Programs in Schools

The reorganization of many schools in rural areas necessitated changes in the agricultural education programs in these schools (38). Farming methods were also changing, and the population of rural areas was decreasing. These changes focused attention on a redefinition of the clientele for agricultural education (44) and on the meaning and interpretation of the Smith-Hughes Act (47).

In program planning the use of advisory councils and committees received increased attention (35, 37, 56). According to Scott (56) there was general acceptance of advisory councils by leaders in agricultural education; technics not formerly available made success with councils more certain. Hamlin (37) found that advisory committees were used to recommend policies for agricultural education in Illinois. Altho advisory committees were used to assist in the development of policies for local departments of agricultural education, Gingery (32) noted that most states did not have a printed statement of policy for the vocational agriculture program at the state level.

The changes in agriculture caused professional workers in agricultural education to re-examine the objectives of vocational agriculture. Chase (19) found that one of the most significant trends during the past 50 years was the one-third decline in the farm population, in spite of the doubling of the total population of the United States. His study further revealed that the head teacher trainers in agricultural education believed (a) that in light of socioeconomic trends in agriculture the objectives in agricultural education should place primary emphasis on establishment in farming, (b) that some arrangement should be made to prepare for occupations related to farming, and (c) that present training should be modified to include guidance for those who may leave the farm to enter

nonfarm occupations. Chase found agricultural educators sympathetic to the idea of providing training in agricultural education for those who were or who might become part-time or resident farmers, for those planning to become skilled farm laborers, and for those planning to enter an agricultural college. The agricultural educators involved in Chase's study also believed that training should be provided in general or nonvocational agriculture.

Most of the agricultural courses taught in the public schools were vocational, but there were some general or nonvocational courses in existence (17). Some junior colleges provided terminal courses in agriculture (18, 67). An apparent trend in agricultural education in the public schools was the development of multiple teacher departments. Williams (68) found such a trend in Virginia. He also found that more patrons were reached in multiple teacher departments altho the number of patrons reached per teacher was about the same. Hamlin (36) reported that in the central United States teachers were added in departments primarily to care for rising high-school enrolments in vocational agriculture; however, the effect was that, while high-school enrolments increased 19 percent, adult farmer enrolments increased 82 percent, and the young farmer enrolments, 192 percent.

The success of an agricultural education program is partially dependent on the teachers in the program. Torrence (65) reported a statistically significant relationship between success as a teacher of vocational agriculture and knowledge of technical agricultural information, proficiency in performing agricultural manipulative skills, and knowledge of professional educational information. Nelson (50) developed a vocational agriculture scale for the *Strong Vocational Blank*. This scale was made available for use in the preliminary guidance of prospective teachers of vocational agriculture.

Several studies pertained to the use of time by teachers of vocational agriculture. Surveying conditions in selected states, Zimmerman (72) found that the average teacher studied devoted 57.1 hours per week to professional activities. Hill (41) reported that in West Virginia teachers with the larger out-of-school programs worked more hours per week than the teachers with smaller out-of-school programs altho the former used less time for supervising all-day students' farming programs, for planning for teaching, for professional study, and for FFA activities than did the teachers with the smaller programs.

Farming Programs of Students

Studies have been made concerning numerous specific aspects of farming programs such as farming program visits (21), the use of credit (70), the use of school land (25), efficiency goals (29), the selecting and initiating of programs (26), and father and son farming arrangements (33). Phipps (51) found that the chief emphasis in Illinois was on live-

stock projects with particular emphasis on swine projects. Many high-school boys failed to receive experiences with crops thru their own crop production projects. Garner (30) reported that a significantly greater number of the teachers with the more effective farming programs used approved practices for initiating and supervising farming programs. According to Deyoe (25) approximately 19 percent of the vocational agriculture departments in Illinois operated plots of land varying in size from small acreages to 100 acres or more. He found, however, that there was no trend toward an increase in the number of departments with school land, and that in most cases where large acreages were involved there was a tendency to modify or abandon operations after a few years, largely because of excessive burdens on the teachers.

Teaching Procedures

Traditionally the agricultural characteristics of a community are studied along with the farming programs of former students as a means of obtaining information for use in selecting the content of vocational agriculture courses. Robinson (53), however, reported that approximately 84 percent of the teachers of vocational agriculture in Pennsylvania high schools used student participation in planning their courses of study. Some workers in agricultural education believed that more attention should be given to the teaching of farm management topics. Woodin (71) studied the teaching of farm cooperatives and farm marketing by Ohio teachers. He reported many worthwhile accomplishments from the study of farm cooperatives such as the increased use of existing cooperatives.

Content and emphasis in courses in farm mechanics have been given attention by research workers in agricultural education. Phipps and Deyoe (52) reported that farmers believed the following areas should be given most attention in farm mechanics instruction: (a) farm safety, (b) repairing and adjusting farm machinery, (c) carpentry, (d) farm tractor maintenance, (e) soil and water management, (f) sharpening tools, and (g) farm wiring. Hamilton (34) found that the managerial abilities important in teaching farm mechanics were generally underemphasized. Sharpe (57) studied the farm mechanics projects of the Pennsylvania State Farmers of 1951 and 1952; he discovered that most of the projects of these State Farmers were related to their farming programs.

Thompson (64) developed an experimental pattern which involved many theoretically desirable aspects of good teaching. He found that students taught according to the experimental pattern gained significantly more facts than did those taught by a conventional pattern.

Teachers of vocational agriculture studied in Alabama used a wider variety of audio-visual materials than did the nonvocational teachers studied (8). However, the teachers of nonvocational subjects used maps, charts, models, and mock-ups more frequently than did the teachers of agriculture.

Love (45) examined the effectiveness of different methods of presenting pasture research data to vocational agriculture and young farmer students. He reported that the students who studied the principles and purposes of soil testing systematically in classroom instruction gained significantly more knowledge of pasture improvement than students who engaged in pasture improvement but who did not use soil tests and who received information and advice only thru the usual channels. The teaching procedures followed by the teachers in the veterans programs in Wisconsin were studied by Cooper (23), who reported that the more effective teachers used many of the theoretically approved practices in teaching. A problem in agricultural education is the selection of reading material that is adapted to the reading level of the students. Christensen (20) found that the frequency of use of a book in agriculture courses is not always a reliable guide to the readability of the book.

Guidance and Counseling

Socioeconomic trends in agriculture motivated many studies regarding farm opportunities (11, 54, 61). Chase (19) pointed out that not all boys who desired to farm were able to establish themselves as farmers. This situation made guidance and counseling important at all levels.

Many studies were conducted to determine the number of former high-school students in vocational agriculture who become farmers. A follow-up study (54) of former high-school students in Virginia for the 31-year period between 1918 and 1949 revealed that 23.98 percent of the former students were engaged in farming, and that 6.27 percent were engaged in occupations related to agriculture. The percentage of their ex-students engaged in farming decreased after 1926 when the first follow-up study was made, but the number entering farming increased. The increase in size of farms and the growing competition for the existing farms made establishment in farming more difficult; however, there were vast differences in opportunities to become established in farming in the various areas in a state and in the United States. Beyl (11) found that in different parts of Wisconsin the opportunities for establishment in farming varied from practically none, except by inheritance, to virtually unlimited opportunities. The ages of beginning farmers ranged from 23.78 to 33.36 years in Indiana in a study reported in 1949 (61). Bjoraker (13) concluded that a farm boy's desire to remain on the farm increased with larger farming units and larger farm businesses; also of primary importance was the nature of the boy's responsibilities.

Agriculture teachers and students in agricultural education recognized the value and importance of occupational information (15). The achievement of students in a certain area in Pennsylvania was found to be related to their reading ability as measured by the *Iowa Silent Reading Test* (31). The results of this study may indicate that teachers of agriculture need to give guidance regarding the improvement of reading abilities.

Adult Education

The public schools provided agricultural education not only for high-school students, but also for adult farmers, young farmers, and veterans who were farming. Several comprehensive studies of adult farmer education were completed (16, 48, 55). Twelve states in the central region participated in a study regarding the organization, conduct, and evaluation of adult farmer courses (16). This study showed that teachers of adult farmer courses had used a great variety of practices in organizing and conducting their courses. Some of the practices were widely used while others were utilized by only a few teachers.

Schroeder (55) in a study of adult education in 352 schools in nine North Central states revealed the value of 30 practices and six criteria in evaluating local programs of adult education in vocational agriculture. In a study of the practices used and valued by teachers of the more effective and less effective adult farmer programs in Michigan (43), it was found that the more effective programs used, on the average, 101 practices and rated 68 of these of much value. The less effective programs used, on the average, only 75 practices and rated 46 of them of much value.

Many educators in agriculture in recent years have indicated that one of the most important phases of the program in vocational education in agriculture is the education of young farmers. Young men may profit in many ways from young farmer courses. Young farmers enrolled in agriculture courses for out-of-school young men in Virginia exceeded to a significant extent in leadership abilities the young farmers who had not pursued such training (9). A study by Wall (66) in Kentucky revealed conclusively that there was need for programs of systematic instruction in agriculture for the out-of-school young men on farms in Kentucky. The importance and need for young farmer education was shown by the age at which the young farmers studied first assumed major developmental tasks (40); as might be expected, the first year of farming was the year in which the farmers studied assumed the most new responsibilities.

In Vermont (24), factors which hindered the conducting of young farmer programs were identified as follows: (a) local citizens did not realize the potentialities of the program; (b) schoolmen lacked knowledge of the number of young farmers who might be interested; (c) teachers lacked time at night; and (d) teachers were inadequately trained for determining the educational needs of young farmers and for teaching young farmers. In successful young farmer classes, teachers tended to use a maximum of class participation in the selection of subjectmatter for the courses (49).

Since 1946, vocational education in farming has been provided for the veterans both of World War II and of the Korean conflict. In most states the education was provided by the public schools, but the program was financed by the Veterans Administration. The scope of the program

is indicated by the costs, which were greater than the federal cost for the regular program in vocational agriculture from 1918 thru 1951 (22). The importance of the program motivated considerable research. A nationwide study (22) of the education of farm veterans revealed that the program was unusually effective in assisting veterans to become established in farming and community life. Ninety-two percent of the veterans studied stated that the public schools should offer broad programs of instruction in agriculture for adults. A committee studied the educational program for veterans in farming in the central region of the United States (39). Ninety percent of the veterans studied were well established in farming, and nearly 95 percent of them indicated that they wanted advice and counsel from their instructors even after the completion of their training program.

Agan (1) investigated swine management practices used by participants in a veterans program. A comparison of the scores made by veterans in training and veterans not in training showed a highly significant advantage in favor of the group in training. Soil management practices used by veterans in a training program were examined by Donahoo (27). Highly significant differences in favor of the veterans were found in the extent to which 23 soil management practices were used by the members of the veterans training group and by the control group. It was found further that there was a significant difference between the extent to which approved practices were followed by the veterans who had had training in adult farmer or young farmer classes and the extent to which approved practices were followed by veterans who had not had such training. The difference was in favor of those who had been enrolled for either or both of these types of classes. McKimpson (46), however, found little evidence to indicate that veterans in farm training classes were using more approved practices in their dairy and beef cattle enterprises than the veterans not enrolled in these classes. He suggested that this may have been due in part to the cost involved and the time required in applying approved practices in dairy and beef cattle management.

Implications of the veterans program for adult farmer courses sponsored by the public schools were examined by Sweany (62). His study revealed that veterans tended to support enthusiastically programs of adult education for farmers. Veterans in general desired an adult education program that was more extensive than had been offered in the regular adult programs for farmers.

Evaluation

Williams' study (69) indicated that the activities, methods, and procedures used by teachers in agricultural education seemed to be most effective in helping students meet their vocational needs. His data indicated that the teachers were only somewhat effective in helping students

meet their health, family, scientific understanding, leisure time, ethical, and communication needs, and that they were least effective in helping students meet their citizenship, marketing, purchasing, and esthetic needs. Former students representing 90 different occupations other than farming were found by Thomas (63) to be of the opinion that their vocational agriculture training was helpful to them in their present occupations. Sledge's study (58) revealed that participation in FFA activities may have helped to hold students in vocational agriculture courses.

Eighty American Farmers in Pennsylvania from 1940 to 1952 continued to exhibit the desirable characteristics which had made them outstanding in high school (28).

Considerable interest was shown in the effect of agricultural education in the public schools on the scholarship of the trainees in college (10, 12, 14, 42). Data (10) revealed that students at Oklahoma A & M College who had a background of high-school vocational agriculture did consistently better work in those subjects which were directly related to agriculture than those students who had no background of high-school vocational agriculture. Brimhall (14) concluded from his data that the vocational agriculture curriculum did not jeopardize a student's chances for success in academic work in high school or in college. Hill (42) found that the agricultural students and the nonagricultural students were equal in academic achievement in high school.

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CHAPTER III

Home and Family Life Education

ROXANA R. FORD

ANY discussion of research in home and family life education is fraught with difficulties. In few other fields do so many different disciplines make direct contributions to the subjectmatter. When attention is turned to the teaching-learning situation with all of its ramifications, the scope is enlarged tremendously. The volume of research has been swelled not only by the breadth of the field but also by the increasing numbers of graduate students who have presented master's and doctor's theses based upon individual studies. It was necessary, therefore, to impose rather strict limitations in selecting materials for inclusion in this REVIEW. Attention has been focused primarily upon investigations by professional research workers in home economics education.

Vocational Homemaking Education

One of the most comprehensive evaluations in this area was made by O'Donnell (19, 20, 21, 22) who examined the reimbursed vocational homemaking program in Michigan to (a) determine the status of the program, (b) identify discrepancies between practices in local programs and the philosophy generally accepted by leaders, and (c) clarify bases for program evaluation and development. The study was limited to vocational programs since consultant services had been available for their development and since the underlying philosophy of the vocational homemaking programs had been expressed thru state plans and other official publications. Four areas of belief were selected for study. These were (a) that homemaking education is a cooperative program in which home and school work together; (b) that it is an integral part of the school program; (c) that it is based on recognized needs, interests, and problems of adolescents and their families in relation to personal development and personal and family living; and (d) that teaching-learning methods are those which contribute to the goals of homemaking.

Separate instruments of a questionnaire type were developed for use with administrators and homemaking teachers, students, and parents. Twenty-three of the 30 schools selected at random from the official list of reimbursed vocational homemaking departments participated in the study. During a one-year period, data were collected from 1169 pupils, 697 parents, 23 administrators, and 23 homemaking teachers.

There was little evidence that beliefs concerning home and school cooperation were implemented in the programs represented in the sample. Less than 10 percent of the parents reported an opportunity to share in the program altho a majority expressed willingness to participate in vari-

ous ways. Wide variation was shown in the degree to which homemaking education was recognized as an integral part of the local-school program. Administrators and homemaking teachers agreed that the homemaking teachers assumed considerable responsibility for family life education but differed markedly in their assessment of the responsibility carried by biology, social science, and physical education teachers for such instruction. Distinct differences in opinion were evidenced as to the suitability of instruction in homemaking for girls who planned a college career.

There was scant evidence that needs, interests, and problems served to any great extent as a basis for program planning. Fewer than one-fourth of the students and one-tenth of the parents reported sharing in planning; less than 12 percent of the homes were visited to give understanding of problems or needs; and stated goals tended to emphasize content and skills rather than sensitivity to adolescents, families, and community conditions.

There was great variability in the methods used to achieve goals in different areas of homemaking. Use was made of group-developed evaluative devices. Approximately one-fourth of the pupils had concrete experiences in the learning situation but these were primarily in the areas of foods and clothing. Relatively little use of recognized aids to learning was made in many areas of homemaking.

Homemaking Programs

The most detailed study of homemaking programs in secondary schools was that carried on by Brown (3) in Minnesota. Twenty schools paired on seven factors and drawn from four population groups participated in a five-year study. The project was undertaken to identify strengths and weaknesses of the programs, to learn as much as possible about factors which seemed to influence their effectiveness, and to discover ways in which programs might be improved.

Participating schools were visited at least twice yearly for the first four years and once during the last year of the study. In addition, conferences were held for superintendents and teachers while others were arranged for teachers and representative students from each school. Summer workshops were also conducted for the teachers. Extensive objective data relating to schools, to teachers, and to students were obtained. To study the effects of instruction, a variety of evaluative procedures was used: tests, score cards, record forms, and checklists. Many of the instruments were developed in the course of the study and were believed to be reasonably acceptable from the standpoints of validity, reliability, objectivity, and discrimination.

Students tested during the study included girls enrolled in homemaking classes in Grades IX thru XII, a group of girls who had not been enrolled in homemaking classes at the high-school level, and a group of boys about a third of whom were enrolled in a homemaking course. Statistical

analyses were basically simple altho highly technical analyses were made of one aspect of the work and presented in a separate report (1).

Students in the typical school appeared to achieve less in homemaking classes than had been expected. About one-fifth of those enrolled made no higher scores on pencil-and-paper tests in the spring than in the fall. The average score on garments made in Grades X and XII was so little higher than that made in Grade IX that the difference was not statistically significant. The average diet score of girls with maximum training was lower than that of students enrolled in Grade IX. However, students taught in schools considered to have a favorable climate for learning presented a more favorable picture.

Education for Personal and Family Living

One of the most comprehensive studies in this area was reported by Cornell and Lacombe (7), who formulated objectives for education for personal and family living on the basis of extensive reading and on data provided by parents, students, and educators. The status of secondary-school students' knowledge and judgment on these matters was then assessed. Five thousand boys and girls in Grades IX and XII in New York towns under 50,000 in population were studied.

Many factors affected scores. As expected, there was a close correlation between academic ability and score. Broken homes affected scores adversely. Students whose parents had professional or managerial jobs scored higher than others. Students who belonged to organizations themselves tended to score higher as did those whose mothers belonged to the Home Bureau. Students with no regular home tasks scored lower. Investigators were unable to make direct comparisons between specific home economics offerings and scores since the subjectmatter of tests was not limited to home economics, no provisions had been made for testing performance, and an ambiguous question prevented obtaining accurate information on the amount of home economics work taken.

It appeared that, when home economics was well organized and well taught, it affected the entire school. A substudy was made of schools which were rated by supervisors as above average in quality of program. Students in these schools had scores well above the average. There was a positive relation between the students' scores and the extent of the adult homemaking program as well as the membership of the mother in the Home Bureau.

A second substudy was made in which differences in values held by parents and students were identified thru the use of a value scale. Attitudes toward personal and family living were measured both by tests and by opinionnaires. Students from broken homes responded in a way that indicated markedly different values. A projective technic pointed up basic problems in family relations.

It is noteworthy that in these studies, and in many others, emphasis was given to the necessity of identifying needs in the local situation as the basis for planning an effective program. The influence which the teacher had on success of the planned program was also stressed.

Programs at the College Level

Colleges and universities have been concerned with the quality of their programs in this area. Recognizing the difficulties attendant on making more than a superficial examination, Lehman (14) studied a variety of procedures in appraising the college program in home economics. Three phases of the study were to be made: departmental self-survey, determining ways to check on the effectiveness of the curriculum in changing behavior in the direction of the goals, and finding ways to discover the effectiveness of departments' graduates. Progress on the first two phases has been reported. The department self-survey was necessary not only to help the departments look at their own programs but also to provide useful information for future evaluation studies. Forms developed for the survey were such as to encourage accuracy and objectivity and were believed to be valid for their purposes. Since the five cooperating Ohio colleges agreed on the importance of the home economics curriculum in contributing to the development of social sensitivity, ability in managing personal resources, and increasing the effectiveness of the individual as a homemaker, instruments were developed to measure progress in the attainment of these objectives. Devices were of a form not customarily used in classroom testing, cut across subjectmatter lines, were appropriate for use at both freshman and senior levels, and were so designed that meaningful interpretations could be made readily both to students and to staff. This work should serve as a stimulus and aid to other institutions in a study of their own programs.

Curriculum

Two studies have particular meaning for those concerned with college curriculum. Nelson (18) investigated factors related to mortality among students in selected colleges. Losses were proportionately greater in large than in small institutions. Students in large schools criticized the number and difficulty of prerequisite courses, the tendency of courses to be theoretical in nature, and the postponement of the so-called practical courses. Those from smaller schools considered much of the home economics content to be repetition of high-school work. While marriage was given most frequently as the reason for withdrawal from school, lack of effective guidance both before and during the college experience seemed to be a factor. Greatest mortality occurred at the end of the freshman and sophomore years. Reappraisal of course content and sequence was recommended.

A study of the graduates of the University of Minnesota home economics education curriculum by Rose (25) gave some indication of the extent to which the program contributed to the needs of the individual as a person, a homemaker, a citizen, and a teacher. It made possible some comparisons of this group of students with those in other curriculums within the university.

That the home experience was more effective when it was an integral part of the homemaking curriculum rather than a supplement to it was suggested in an experimental study by Lippeatt (16). Students in Grade IX in 16 Arkansas schools were studied. In half of the schools, integrated programs based upon abilities and interests of the groups were carried out. In the remainder projects were used simply in addition to the classroom activities. Students in the first group showed higher achievement while voluntarily carrying on almost four times as many activities. Bateman (2) found, in a study of teachers in New York State, that both recognition of the value and the use of community resources were associated with the amount of training in the use of the community and the amount of time available for home visits. Teachers who had been in their present positions for five to eight years and those who had taught for a similar period tended to use home resources to a greater degree than did others. Use of home resources decreased as the size of town in which the school was located increased. Homemaking programs of 20 Virginia schools (8), selected because of "good" home experience work, were analyzed to find what practices in home project supervision were being followed, which were effective, and what modifications seemed to be desirable. Interviews were held with students and their mothers as well as with principals and homemaking teachers in each school. All agreed that home projects represented an important method of teaching and contributed to improved home living. No uniformity in planning or reporting was evident. Projects selected were governed by the nature of the classwork and the need of the student, and the length was dependent upon the nature of the project. One uniform practice was that of informing incoming students and their mothers of the home project program prior to the opening of school. Parents believed that projects should be required and carried on thruout the year. Principals pointed to the need for more individual guidance and more home visits.

Proposals for strengthening the program of homemaking education in California were made by Hall and McCollough (11) on the basis of a study of schools from each of the eight areas of the state. Thru response to a questionnaire, former and present homemaking students as well as high-school girls not enrolled in homemaking classes gave opinions as to why students do or do not enrol in homemaking classes and as to ways in which such classes benefit students, school, and community. Regional supervisors of homemaking education interviewed homemaking teachers and school administrators. A team approach to group conferences with nonhomemaking teachers and parents proved to be an interesting and fruitful procedure.

Student Abilities, Attitudes, and Problems

The problem of widely varying ability among students in high-school homemaking classes has become more vexing as class size has increased. Koivisto (13), attempting to clarify the role of the teacher in the education of the slow-learning girl, found that neither preservice courses nor inservice activities provided much assistance in solving the problem. Ninety-one percent of the respondents had slow learners (defined as those with an IQ between 50 and 90) in class. Since more than half of these 377 teachers expressed concern over teaching children of subnormal intellect, the problem seems to be one to which much more attention might well be given.

Lyle (17) compared a group of rural homemakers having low socioeconomic scores with a group having high scores to discover whether problems and needs were characteristic. Informal but carefully planned interviews were arranged. Distinct differences between the needs and practices of the two groups were shown.

Finding the effort to identify reasons for nonparticipation in adult homemaking programs unsuccessful, Chadderdon and Lyle (4) directed attention to reasons given by Iowa homemakers for participation in such programs. Homemaking teachers administered a questionnaire during a regular meeting of adult groups in a carefully drawn sample of towns. Usable forms were returned by 1385 homemakers. An analysis of the questionnaires confirmed a hunch of many adult educators. Some differences in incentives for attendance were shown which might well be used by those responsible for the administration of adult programs as well as by teachers of adult classes.

Dalrymple (9) found clear-cut support for the belief that richness of experience with homes and children was associated with proficiency in teaching homemaking. Similar studies with larger groups would be desirable.

Questions of interest to teacher educators were raised in a pilot study of student teachers' reactions toward teaching homemaking to adults. Walsh (29) used a two-part instrument which elicited an emotional reaction, a value judgment, and an expression of feelings of adequacy of preparation for teaching various areas of home economics. Altho by no means conclusive, this study points to the need for re-examination of professional education sequences with a view to including over a period of time the maximum number of effective teaching experiences with groups of adults. Rossman, Riegel, and Hillier (26) reported on their efforts to improve the curriculum for prospective home economics teachers at Pennsylvania State College.

Teaching Methods

Among the most carefully controlled studies of methods have been those Price (23, 24) directed with high-school foods classes. The prevalence of

the 60-minute class period, which is administratively desirable in many instances, raised questions concerning the nature of the experiences which could be provided as well as the quality of learning which resulted. Seventy-five Ohio teachers participated in a study in which they cooperatively set up major objectives of foods classes in Grades IX and X, planned units to be taught, used comparable teaching procedures in laboratories which provided similar working conditions, gave uniform practical and written tests, and used like procedures to obtain evidence of student growth. Findings show that foods can be taught successfully on the meal basis in either a 60- or 90-minute period, that each has its advantages, but that both teachers and students tend to be more efficient in the shorter time.

Clewell (5) investigated practices which college teachers and administrators found helpful in maintaining or improving effectiveness of instruction. Also identified were areas of concern for improvement. The need for recognition of what is being well done was stressed as was the desirability of experimentation with teaching procedures and the sharing of the results.

Hatcher (12) proposed some evaluation technics which were planned to be effective also as teaching technics. The procedures, primarily for use with groups of younger pupils, reflect the belief that the individual should be involved in all phases of the learning process.

Altho not reporting actual research on college teaching, Eckert (10) made an excellent contribution by pointing out trends, most of which were well grounded upon research findings.

Administration

Studies selected for review may have implications for state supervisors, college administrators of home economics, or secondary-school administrators. Coleman's analysis of responsibilities (6) carried by beginning homemaking teachers should concern all three groups. Interviews, logs, and questionnaires were used to collect data from 50 teachers at elementary-school and junior and senior high-school levels in seven states. Teachers had a wide range of responsibilities, assumed these duties to the best of their ability, and worked with individuals and groups both in the school and in the community. There was no evidence of the use of effective technics for diagnosing the human relations needs among students. Authoritarian procedures were used by the teachers in the selection of educative experiences and evaluation technics. Skills and technics in foods and clothing were emphasized to the neglect of other areas.

An analysis of a state program of inservice education was made by Vossbrink (28) who collected information from state supervisors, field workers in home economics education, superintendents, and homemaking teachers. Findings point to the use of technics which seem not to be the most promising ones and to weaknesses in evaluation. Many positive aspects of the educational program were identified.

Stephenson's study (27) of the cost of an adequate food preparation program resulted in an excellent guide which should prove helpful to public-school administrators and homemaking teachers in development of budgets.

Heartening in one sense, disturbing in another, is Lehman's study (15) of the employment status of the home economics alumnae of one institution. Almost all the graduates were or had been employed in some field closely related to home economics. For the married graduate, the trend toward full-time work was associated with increased membership in organizations but decreased service to the community.

Needed Research

Much of the present research is of a continuing nature. Insights are being gained which will lead to still other studies. Examination of college curriculums in the light of reappraised objectives seems to be needed. Increasing enrolments in schools and colleges raise questions to which research might contribute answers. Among these questions are: What procedures will promote effective learning for all students when needs, interests, and capacities vary greatly? What teaching-learning procedures are effective in large groups? What may be done to utilize most satisfactorily the resources represented by the teacher?

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CHAPTER IV

Industrial Education

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THE term *industrial education* is used here in a generic sense to include industrial arts and all phases of vocational-industrial education, namely, day trade, technical, part-time, evening trade extension, apprenticeship, and in-plant training. The report covers research done in these areas from September 1, 1950, thru August 31, 1955. However, only doctoral dissertations and nondegree studies of merit are listed in the bibliography.

Distribution of Studies by Areas and Degrees

As has been true in the past, most of the research in industrial education during the period was done to meet degree requirements of graduate schools. At least 820 master's theses and 142 doctor's dissertations were

TABLE 1.—DISTRIBUTION OF STUDIES BY AREAS AND DEGREES

Areas	Industrial arts		Vocational-industrial education		Total
	Master's	Doctor's	Master's	Doctor's	
1	2	3	4	5	6
Course content and curriculum	136	15	27	7	185
Surveys of educational programs	76	6	73	18	173
Teaching methods and devices	79	7	14	1	101
Shop planning, equipment, and supplies	77	6	4	1	88
Guidance, placement, and follow-up	40	1	32	11	84
Testing and evaluation	45	11	17	7	80
Teacher education	32	19	8	7	66
History and philosophy	30	6	21	6	63
Organization, administration, and supervision	31	1	11	2	45
Analysis of published materials	19	2	2	1	24
Safety	19	2	3	...	24
Apprenticeship	...	...	8	1	9
Driver education	9	...	...	...	9
In-plant training	...	...	7	2	9
Rehabilitation	...	...	...	2	2
Total	593	76	227	66	962

written and accepted; they were distributed by subject as shown in Table 1.

Course Content and Curriculum

One hundred eighty-five studies were reported in this area during the five-year period. Perhaps the most influential document was a guide published by the American Vocational Association (6) to assist the industrial arts teacher in improving the quality of his instruction. Axelrod (9) planned a course of study in applied science for machine-shop apprentices; Rowntree (50) set up a list of guiding principles for vocational-related instruction; and Deck (23) developed resource units in electricity for different grade levels. Atteberry (8) found that, except in the skilled crafts, certain technical jobs, and clerical occupations, employers in Kansas City attached little importance to specialized pre-employment training. Approximately 75 percent of the employers said they preferred for entry jobs beginning workers who were high-school graduates but only some 50 percent actually required this as a hiring policy.

Youmans (60) obtained opinions of representatives of management, labor, and education concerning the type of training which should be provided by the school for youth going into skilled and semiskilled jobs. Activities and problems to meet the needs and interests of youth in transportation were analyzed by Kleintjes (34). Schmitt (52) outlined content for a course in consumer education, with technics for teaching in industrial arts, and VandeBerg (58) identified the educational needs of prospective home owners. Rudiger (51) ascertained the educational needs of people with respect to the selection, care, and operation of an automobile. He concluded that, while certain needs were obvious and while most people would like to know more about these subjects, public schools have done very little in providing such instruction.

Surveys of Educational Programs

Current practices in evening trade extension classes were studied by Price (46). Hackett (29) surveyed the status and need for industrial education in the white public secondary schools in Georgia. He found that industrial arts programs were provided in less than one-fifth of the schools in spite of the fact that the population of Georgia was predominantly urban and rural nonfarm. Bibb (14) surveyed the private trade schools of Missouri which had been approved for veteran training. He reported that (a) there was little uniformity with respect to cost and duration of like trade courses taught by the different schools; (b) educational qualifications of private trade-school teachers were frequently below those of public trade-school teachers; (c) the schools had not given proper consideration to the supply of and demand for trained workers in some of the trades; and (d) admission standards, guidance services, and placement

records were often inadequate. He recommended that state legislation be enacted to regulate and control private trade schools just as public trade schools were regulated and controlled. Schure (53) made a similar study in New York State in order to formulate a program for the accrediting and educational upgrading of private trade schools.

Teaching Methods and Devices

Studies in this area have not been too fruitful altho several have made contributions. Abramson (1), Norman (44), and Wright (59) experimented with teaching devices and methods. Elliott (24) surveyed the use of audio-visual aids in the teaching of industrial arts. He suggested that industrial arts instructors should utilize their shop facilities and technical knowledge more extensively to produce audio-visual materials for their own use. Factors relating to the teaching of practical arts in self-contained classrooms in the elementary school were investigated by Chamberlain (21). Shackleford (56) studied technics especially helpful to the new shop teacher.

Shop Planning, Equipment, and Supplies

A comprehensive checklist of standards for evaluating the physical facilities of industrial arts laboratories was developed by Bateson (11). Bednar (13) studied the practices of industrial arts teachers in the performance of maintenance, installation, and construction jobs for the shop and schools. Bunten (18) investigated practices used in the procurement and management of industrial arts supplies. Erickson (25) established equipment requirements for junior high-school general shops, and McArthur (39) ascertained the practices used in the selection and management of equipment in industrial arts shops.

Guidance, Placement, and Follow-Up

Oakley (45) studied the relation of guidance and concomitant attitudes to the industrial education program of a large city. He found that both general high-school and trade preparatory students considered vocational training worthwhile. However, only a very small percentage pursued or planned to pursue such training at the city's vocational high school, in part because they considered the school a "dumping ground" for academic "misfits" and "disciplinary cases." Baskin (10) found significant differences in favor of a work-study group as compared with a group lacking experience in such a program. London and others (37) made a follow-up study of approximately 2000 day trade graduates of the central United States who had been out of school five years. They found that 42.5 percent were employed in the trade for which they were trained, 12.6 percent were employed in related trades, and 44.9 percent were employed in non-

related occupations. The National Manpower Council (42) published a volume in which it framed a comprehensive approach for dealing with the skilled manpower component of the nation's labor force and formulated policy recommendations for further development of our skilled workers and technicians. Another publication by the Council (43) was devoted to stimulating an interest in the problem of skill development and to providing new information on ways of achieving desired policy objectives.

Testing and Evaluation

In this area are to be found a number of studies which suggest a "new era" of research in the field. Seidel (54) developed a plan for evaluating programs of vocational-industrial education. Cassidy (20) developed a method to identify essential elements in trade ability for use in written tests to measure trade ability. Chatfield (22) made an evaluation of industrial arts teacher education in Connecticut; he reported that a majority of the graduates were satisfied with over half of their undergraduate curriculum experiences. Quick (47) found no very startling differences between teaching and nonteaching baccalaureate graduates with industrial arts majors. Burdette (19) concluded that the influence of industrial arts instruction on consumer knowledge was low. Kjos (33) compared the occupational experience and success of day-trade graduates with general high-school graduates in industrial jobs. Larger percentages of the former obtained employment in trade or industrial occupations; they were only slightly more successful in these jobs than the latter. The day-trade graduates employed in trade and industrial jobs started work at a higher weekly wage, but after four years the two groups earned approximately the same average wages which increased at similar rates.

Teacher Education

More doctoral studies have been worked out in this area than in any other. An appraisal of the preparation of industrial education supervisors in Ohio was made by Brandon (15), and Reese (48) evaluated the teacher education program for trade and industrial teachers in that state. Lux (38) developed a program of cooperative vocational teacher education for Illinois. The duties, responsibilities, and activities of coordinators of part-time co-op programs in business and industrial occupations were found by Kohrman (36) to be essentially the same. Kohler (35) analyzed the graduate programs in industrial teacher education in 66 institutions with a major in that field. He found a wide variation in graduate course offerings and requirements.

Senteney (55) reported that the most important reasons given by college graduates for beginning their college industrial arts training were "interest in this type of work," "high-school shop experience," and "work experience." Over half of those who left teaching or did not enter it gave

as their chief reason, "salary in other occupation attracted me." Brown (16) studied the competencies needed by industrial arts teachers in the elementary school. Jarvis (31) found that the high-school rank of those who graduated from Stout Institute was significantly higher than the rank of those who dropped out. The relation of work experience in industry to teaching practices and success of industrial arts teachers was found by Gaines (28) to be negligible, while Risher (49) found a low, positive correlation between rated success of beginning industrial arts teachers and college marks. In 1952 the American Council of Industrial Arts Teacher Education (2, 3, 4, 5) initiated a series of yearbooks devoted to the improvement of industrial arts teacher education.

History and Philosophy

Bawden (12) prepared a series of biographical studies of industrial education leaders in which he pointed out their chief contributions. Included in the series were Struck, Whitcomb, Hunter, Noyes, Dean, Leavett, Myers, Prosser, Snedden, and Smith. The factors which influenced the enactment of federal legislation for vocational education were studied by Morgan (41). Franklin (26) recorded the history of industrial education in Oklahoma, Frederick (27) traced the origin and development of industrial education in New Mexico, and Menegat (40) studied the history of trade education in Oregon.

Other Studies

Anderson (7) found that several leading woodworking textbooks included information on fewer than half of the informational items considered essential by Forest Laboratory personnel; many of the items included in the texts were covered only scantily. Hammer (30) explored the relation of trade and industrial school education to apprenticeship training. Brown (17) surveyed the hiring, advancement, and in-plant training practices of a group of industries. The organization and administration of industrial education at the state level were studied by Karnes (32).

Problems Needing Study

In June of 1955 the vocational division of the U. S. Office of Education held a three-day conference in Washington on needed research in industrial education. The conference group identified 75 problems in industrial education which they felt should be studied. These, in turn, were sent to state departments of education and to teacher education institutions where they were rated as to relative importance. From the composite of these ratings, the U. S. Office of Education (57) listed the following 15 problems as those most in need of study:

1. The impact of industrial trends on trade and industrial education
2. Procedures and standards for selecting students for training in day trade and industrial courses
3. The philosophical, economic, psychological, and social bases for trade and industrial education
4. Determining the attitudes of certain groups of people toward trade and industrial education
5. Determining ways and means to provide more adequate related instructional materials
6. Establishing occupational areas and program standards for vocational technical education
7. Learning activities that have most value for youths preparing for trade and industrial occupations
8. Methods of extending and improving training services for adult workers
9. The establishment and acceptance of the responsibility for placement and follow-up of trade preparatory students at the local level
10. Comparing the general type of trade and industrial program, cutting across craft lines, which includes two or more families of occupations with the specific types of program organized within craft or trade fields
11. The field service activities engaged in by teacher trainers in trade and industrial education
12. The training and activities of all personnel rendering guidance service to secondary school students
13. The relative advantages and disadvantages of the comprehensive high school versus the separate vocational school
14. The relationship of consecutive hours of organized instruction and supervised practice to efficient training for trade and industrial occupations
15. The extent and nature of training needed for trade extension teachers.

Trends

In recent years there has been a tendency to eliminate the research requirement for the master's degree in industrial education; as a consequence, the number of master's theses in the area is declining. At the same time the number of doctor's dissertations is increasing as is the number of independent research studies. The over-all effect is to raise the quality of research in the area. Still lacking, however, is any great number of experimental studies and cluster type studies dealing with several aspects of big problems.

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CHAPTER V

Business Education

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THE period of six years preceding publication of this issue has been one of productivity in research in business education. This chapter is the result of analyzing by title the more than 1200 studies at the graduate level, reported by the *National Business Education Quarterly*, and certain studies not included there. More than 400 studies were reviewed by abstract, and selected ones were reviewed in the original form.

The number of studies reported as completed has been quite stable from year to year, about 200, altho the number of doctoral studies has increased 50 percent during the period. Encouraging is the increasing number of independent faculty research projects reported.

Numerous studies, especially at the master's level, are of the normative survey type; they are important, in the main, only to the local community surveyed because research workers tend deliberately to limit the scope of their studies to small localized populations from which inferences usable by others cannot be drawn. While such studies contribute to better instruction in the local classrooms and to better preparation of the teacher in his specialty, it may well be that the present quantity of such studies is not justified because of their limited value to business education as a whole. In too many studies the research worker collects data and presents findings but fails to make clear the implications of his study for teachers and administrators. On the whole, however, there has been in the period reviewed evidence of notable improvement in research design, sampling technics, and statistical treatment.

Organized Group Efforts

A significant development during this period is the attention accorded research by professional organizations. The coordination of effort and encouragement provided by these groups to research-minded people appears most valuable. In 1951 Delta Pi Epsilon, the United Business Education Association, and the National Association of Business Teacher Training Institutions joined in organizing a Research Foundation. One important contribution has been the study of needed research in business education (46).

In 1952 Delta Pi Epsilon began its research abstract series. This series, published annually in cooperation with other professional organizations, abstracts the more important studies (20). These abstracts prove especially helpful to the research worker. The Central Region Group of Supervisors and Teacher Trainers of Distributive Education formed a research committee in 1956 and began several statewide studies. The Joint

Committee on Coordination and Integration of Research in Business Education initiated a series of efforts aimed at disseminating results of research in a form usable by classroom teachers, a most necessary and previously neglected step in the research program.

Trends in Research Topics

Analysis of over 1200 titles revealed a substantial increase in recent years in status studies and in surveys, especially of the community survey or follow-up types, with implications for local curriculum and instructional problems. Studies relating to bookkeeping and shorthand decreased relatively. Studies in distributive education increased substantially altho few were reported at the doctoral level. More interest was apparent in the problems of business teacher preparation. The problem areas which have been explored offer many challenges for future research.

General Business and Curriculum

Carmichael (8) examined the philosophy of teacher-pupil planning and recorded the pedagogical devices implementing the philosophy in the classroom. He concluded that the development of democratic citizenship thru teacher-pupil planning was necessary to justify the inclusion of business education in the curriculum. Jennings (22) determined the potential contributions of business education to general education by developing 16 problem areas to be used as the basis for core activities suitable to general education. He devised instructional units and analyzed the contributions of business education to each area. Price (38) surveyed 1884 institutions of higher learning and found 500 courses in consumer education. He concluded that interest in such courses was growing but that consumer courses were not available to all students without restriction. In addition he found that topics actually taught in class were frequently not related to objectives deemed important for the course.

Russon (40) found a similarity between predictive formulas for general college achievement and those for college achievement in business education. Using English and mathematics marks and high-school scholastic average, he produced a multiple *R* of .746.

Altho there is insufficient space in this chapter for discussion, it should be noted that 22 studies, many of them doctoral dissertations, were status studies of the business education programs of an individual state. The Maxwell study (30) is illustrative. Review of such studies could present a rather complete picture of the status of business education in the nation and point out future needs. The biennial census of the U. S. Office of Education (47) determined the total enrolment in business education classes as more than 60 percent of the total pupil enrolment in the high schools. Typewriting, bookkeeping, and shorthand remained "the big three."

Bookkeeping

Herring (19) in a review of research in bookkeeping abstracted 242 studies; he found a marked decline in completion of such studies since the 1935-1939 period. He reported substantial recent interest in surveys, methods, and procedures of instruction, and course content. His study has value because of its synthesis of findings and the opportunity it provides to determine areas where research is needed.

A study of prognosis by House (21) illustrated the use of statistical tools of analysis. He found that a combination of certain measures of arithmetic achievement, IQ, and ninth-grade marks were predictive of achievement in bookkeeping courses. Further, he demonstrated that 60 percent of the pupils he studied had insufficient reading ability to deal with the large beginning vocabulary loads of bookkeeping textbooks; he suggested that there was need for better texts, more emphasis upon discussion, and slower teacher presentation.

Nicks (35) surveyed nonbookkeepers in offices to determine their bookkeeping duties. Among other important findings he concluded that bookkeeping duties of nonbookkeepers were easily learned, and he isolated routines in which knowledge of bookkeeping principles and theory were not required. He saw no justification for a year of bookkeeping training as job preparation for nonbookkeepers. Day (11), Stoner (43), and numerous master's studies surveyed bookkeeping practices of small businesses in smaller communities. There is need to analyze carefully the findings of these studies for their implications for the teaching of bookkeeping.

Typewriting

Two major studies presented the results of tachistoscopic training. Winger (50) experimented with college classes for one semester, utilizing timed writings thruout as measures of performance. The analysis of variance was used as a test of significance. The tachistoscopic group developed more rapid stroking rates early with normal growth following. All levels of ability seemed to be aided. The experimental group also demonstrated more accuracy and better control over numbers and isolated letter combinations. Palmer (36) concurred and stressed the permanency of the gains demonstrated by the experimental group. While such studies were of potential value, more widespread evidence was needed especially on a longitudinal basis where the possible motivation of the novel device itself, the tachistoscope, could be measured.

West (49), by verbally inducing a speed set in one group and an accuracy set in another, tested the Gilbreth concept of early emphasis upon developing expert rates in motor skill activities. Speed was found to be a stable factor and not to be achieved at the expense of accuracy. However, multivariate covariance analysis showed that the accuracy

group had fewer errors, indicating that the quest for speed was not favorable in this respect. These findings conflict with other studies; it is possible that the effect of speed set upon accuracy depends upon the degree of stress upon each factor.

Martin's experiment (29) tested the use of a continuous speed-forcing method against use of an interval speed-forcing method. A significant difference between groups was found in error rate but not on speed in straight copy or problem work. Speed was judged a stable factor, and reduction in errors was attributed to the liberation and freedom from the alternating emphasis upon speed and accuracy. Students transferred greatest percentage of stroking rate to problems having greatest similarity to straight copy drills. Penar (37) also demonstrated direct and marked relationships between straight copy rate and problem rate on similar material, illustrating the need for selected drills on troublesome parts of a problem since whole problem practice is straight copy practice.

Brown (7) and Lingerfelt (26) studied the effect of stroke intensity, syllabic intensity, and percentage of frequently used words on typewriting production, producing results comparable to the Bell study of earlier years. Stroke and syllabic intensity were not correlated positively with strokes written. Straight copy material was not a uniform measure of difficulty. Chapman (9) reached similar conclusions altho she found a low positive correlation between strokes and stroke intensity.

Gross (15) found that a visual-association analytic approach developed early superiority over conventional procedures for learning the keyboard, but after 24 class periods, the groups showed no significant differences. These findings illustrate the value of extended study; if Gross had stopped early in the experiment, it would have appeared that the experimental method produced superior results.

Balthaser (3) taught typewriting to elementary-school children and found in 18 days performance similar to high-school groups. The study needs verification on less superior children and for longer periods.

Morgan (32) measured strain in timed writings by checking pulse rates and observations. He rejected the hypothesis that longer timed writings develop more strain than shorter ones and that speed tests are more strenuous than problem tests.

The review and abstracting of 444 research studies in typewriting and synthesis of research conclusions for each of 20 problem areas were completed by Rahe (39). He noted substantial deficiencies in research design and analysis and seemed to reach the major conclusion that many so-called conclusive findings are not conclusive at all, but tentative findings which offer the challenge to verify or refute.

General Clerical

This area has been given marked attention by research workers whose studies are opening up many avenues of approach for further study.

Frisch (12) collected and analyzed specimen business typing forms and papers and presented data relative to the rank of typewriting sources by percentage of items typed. Cook (10) concluded that the *Detroit Clerical Aptitudes Examination* was unstable in a test-retest evaluation and was of little value for predicting success in clerical training. He further attributed poor predictive values to high-school grades and counselor judgments. Guthrie (16) developed an instrument for differentiating employees with and employees without desirable personal traits for office work. Using the chi-square technic, he isolated items for his *Office Workers Opinion Survey* which appears to have considerable merit as a device for selection, placement, and advancement of employees when scores are standardized for an individual company. Construction and verification of such prognostic devices seem to be major needs in vocational education.

Van Derveer (48) analyzed the step-by-step operational procedures of clerical workers and set up "ideal" patterns of performance for 67 clerical operations. She concluded that patterns of performance emerge which provide the teacher and the pupil with valuable learning aids.

Hamilton (18) evaluated the *National Business Entrance Tests*, finding high reliability for the whole test but low reliability for the parts. Measured against workers' job ratings, the test revealed low validity coefficients indicating the need for a long validation program. Nelson (34), in a similar validation study, reported negligible correlations between job performance ratings of stenographers and typists and the stenographic and typing test sections.

Stenographic

Stone (42), using item and response differentiation on an interest inventory to construct an intra-occupational scale, illustrated the substantial relationship between vocational interests and occupational proficiency in shorthand. Missling (31) and Kortendick (23) found the general scholastic average to be the best single predictor (r about .70) of shorthand achievement. Altman (1) reported significant correlation between achievement in Pitman shorthand and measures of IQ, spelling achievement, and quality of handwriting. Lockwood (27) studied certified private secretaries, finding low positive correlations between success on the certifying examination and criteria of education and salary, and low negative correlations between success on the examination and criteria of age and experience.

Morrison (33) applied the principles of learning as found in the literature of educational psychology to a shorthand text series and found the series deficient because it taught parts before the whole, did not create conditions favorable to transfer of learning, and failed to encourage meaningful learning instead of mechanical association.

Tate (44) obtained job analyses of stenographic positions and found that frequency patterns for some duties were similar regardless of office size while other patterns were dissimilar.

An interesting example of determining the adequacy of a sample was demonstrated by Silverthorn (41) in examining the basic vocabulary of written communications. He found that the 50 most frequently used words accounted for 45 percent of word occurrences while 500 words accounted for 70 percent of the occurrences.

Distributive Education

In general the state of research in the stenographic area is illustrative of that in many other problem areas: One immediate need is for the summarization and correlation of the many studies reported so that at least tentative conclusions may be reached about the more important or controversial aspects of the area.

Most studies were centered about the problems of local-school programs, the organization of cooperative part-time programs, and the follow-up of graduates. An increasing number of studies were devoted to the construction of teaching units for distributive classes.

Austin (2) reviewed research relating to selection of sales personnel; he observed that many studies were characterized by inadequate sampling and by research designs limited to one firm. Supported by the studies, he concluded that IQ was not related to sales success and that, while tests of sales ability were of little practical value, interest tests were a promising tool.

Thompson (45) studied sales situations by using tape recordings and concluded that identical selling elements were present in 32 store departments even tho customers and merchandise differed. He also showed the list of elements in retail selling to be more inclusive than previous definitions indicated. Lawyer (25) developed evaluative criteria for sales training and surveyed the practices of representative industrial firms. He noted the limited use of selection methods, the emphasis in sales training upon product and engineering knowledge, and the increasing emphasis upon salesmanship training.

A nonparametric test of significance was demonstrated by Haines (17). He found that personnel in retail stores differed significantly in background when classification factors such as type of store and level of job position were introduced. The fact illustrated the need for more adequate descriptions of population and sampling in personnel studies of this kind.

Beaumont (4) made a frequency analysis of duties of coordinators illustrating the predominance of employer contacts over other coordination activities. Logan (28) determined, interpreted, and evaluated standards and guiding principles governing the operation of distributive education programs and prepared manuals of criteria for evaluation.

Teacher Preparation

Gress (14) determined that testing and grading, discipline, and teaching subjectmatter (including lesson planning and maintaining interest) were the most difficult areas for beginning business teachers. The undergraduate methods courses were judged as inadequate, especially in the areas of basic business subjects and secretarial office practice. Blanford (6) and Bell (5) in follow-up studies of beginning business teachers concurred generally with Gress. Both felt more classroom practice in using instructional methods and in lesson planning were desirable in methods courses. Froehlich (13), in studying bookkeeping methods courses, determined problem areas similar to those of the previous investigators.

Research Needs in Business Education

Langen (24) studied the titles of research completed in 1933-1953 and found great similarity between lists of needed research and completed research, suggesting that findings had not been disseminated properly. He advocated greater research emphasis upon certain aspects of teacher education, including methods, student teaching, and work experience, and upon experimental studies in all areas. In a bulletin of the UBEA Research Foundation (46) Tonne proposed (a) that local studies be of similar design so that results may be compared nationally, and (b) that students at the master's level in many cases be given standard research designs but held for proper collection of data and drawing of inferences. Two other major research needs (46) appear clear:

1. Greater discrimination must be exercised between valid conclusions and inadequately supported findings
2. Acceptable research findings must be carefully interpreted and adequately disseminated especially in a form usable by the classroom teacher.

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CHAPTER VI

Technical Education

GORDON M. HARRINGTON

THIS is the first issue of the REVIEW to devote a separate chapter to technical education. Technological developments of the past decade have spurred a rethinking of the functions and means of vocational education. This is reflected in the fact that, while technical education is not new, it has only very recently moved into a place of prominence on the educational scene. It is not surprising, then, that the depth and breadth of research in many respects lag far behind program development.

The term *technical education* is generally considered to apply to terminal collegiate level education of an applied technical nature. On the one hand, it is to be distinguished from post-secondary vocational-technical education which is of less than college grade. At the other extreme, it is to be distinguished from engineering education, which is of greater duration, leads to the baccalaureate degree, and includes a curriculum content and teaching methods balance much more heavily weighted toward theory than application. The objective of engineering education is to prepare engineers, of vocational-technical education to prepare skilled craftsmen, and of technical education to prepare technicians. Among the groups most interested in technical education the technical institute is often considered the proper locus for such education altho, except for some differences in philosophy regarding the role of general education, the basic distinction between technical institutes and technical programs in junior colleges is a fine one.

The Technical Institute Division of the American Society for Engineering Education (25) prepared descriptions and definitions of technicians and the nature of technical education which are in general accord with earlier literature and which are generally accepted. However, Harrington (5) found in surveying the chief state school officers that in practice technical education was often not distinguished from vocational-technical education offered at the thirteenth- and fourteenth-grade levels. Nor does the research literature of the past six years indicate that the authors have been very successful in grappling with the problem of definition. Accordingly, the interested investigator should read the literature and plan his own research with a clear recognition of the fact that in practice, whatever may be the case in principle, technical education is still so vaguely defined that in many cases outcomes in previous studies are not strictly comparable.

Need for Technicians

A sharp rise in interest in technical education has occurred in the past two years as a result of activities in other than educational circles.

A major factor was the report of a study by the National Manpower Council (13). The report considers the whole range of present status of and future needs for technicians and skilled workers. The primary emphasis of the report was on education. Undoubtedly, it was by far the most significant study published in the area during the period covered by this report.

The orientation of technical education toward application and its status as a growing infant were reflected in the prevalence of community surveys to determine needs as a basis for program planning. Adamson (1), Medsker (12), and Peterson (14) reported briefly on their survey technics and findings. Two extensive statewide surveys were also conducted. Rodes (17), following up a 1949 survey of needs, sent questionnaires to participants and received responses from companies with 157,377 employees and government agencies with 94,887 employees. The respondents represented one-sixth of California's industrial and government employment. He found that the manpower needs required 5.8 percent of the total employment to be engineers and 4.6 percent, technicians. Applying these ratios to the total state industrial and governmental employment, he inferred that there were 70,000 technician positions with a 10-percent annual turnover. This meant an annual need for 7000 technicians. The basis for assuming that the sample was random was not reported.

Harrington (5) interviewed personnel managers in a survey of Connecticut manufacturing industry. He drew a chunk of companies accounting for one-half of the industrial employment of the state. Using random sample check surveys, census data, and Bureau of Labor Statistics data, he concluded that the chunk behaved like a random sample. He estimated that there were 13,500 engineering positions and 14,600 technician positions in manufacturing in the state and that 15 percent of the former and 20 percent of the latter positions were vacant. Using an annual turnover of 8.6 percent obtained in the survey, he found a need for 1200 technicians a year. The ratio of 1.1 technicians per engineer agreed rather closely with a figure of 1.2 reported by the U. S. Department of Labor (27).

Both California (8) and New York State (28, 29) gave some attention to technical education in their state studies of higher education.

Weide (30) took the curriculums of three junior colleges and compared them with census occupational distributions in their respective communities. He concluded that there was often a wide gap between offerings and the realities of occupational opportunity.

Technical Students and Graduates

Next to surveying needs, technical educators were most prone to survey what became of graduates. Following up 7000 technical institute graduates in 300 companies, Booher (3) found that half the companies used

some job designation with the connotation of technician for these individuals, that one-quarter used terminology connoting engineering, and that the remainder used a wide variety of job titles. Hill (6) reported on kinds of jobs held by technicians in one company. Bethel (2) reported the beginning jobs of graduates in the garment field, and Steinberg (24) reported on construction technology placement. Smith and Lipsett (21) obtained transcripts of 31 graduates of the Rochester Institute of Technology who had transferred to college and found that all had received degrees in engineering or science. Rodes (16) surveyed 32 state boards of engineering examiners and found that over one-half gave some sort of credit toward professional licensure for technical institute graduation.

Lipsett and Smith (11) sent questionnaires to enrolled students asking them about factors affecting their choice of institution. Technical reputation and physical plant, practicality, and financial problems were the main factors reported. Decisions by students were usually made in the senior year or after high-school graduation. Students commented most frequently on lack of vocational information in high school and on the importance of prompt correspondence from institutions. In another study, Lipsett and Smith (10) reported earnings of half a million dollars for 441 co-op students.

Curriculum and Personnel

Carter (4) surveyed all junior colleges and land-grant colleges on a number of factors relating to curriculums, staff, and transfers in agriculture. Except in New York State, junior college agricultural curriculums appeared to be primarily transfer curriculums rather than the technical institute type, and staff were commonly drawn from the ranks of vocational agriculture teachers.

Reynolds (15) surveyed reactions to textbooks in technical courses. He concluded that substantial agreement on technical texts was impossible. Hull (9) found the reading interests of technical institute freshmen more juvenile than she expected.

Holderman (7) made a detailed analysis of the educational level, amount of industrial experience, and teaching load of faculty members in accredited technical institutes.

Secondary Sources

Smith (18, 19), Smith and Dudley (20), and Smith and Smith (23) continued the valuable annual surveys of technical institute enrolments.

Smith and Lipsett (22) did some historical research as well as providing a synthesis of much of the technical institute literature. The Technical Institute Division of the American Society for Engineering Education (26) prepared a comprehensive bibliography.

Research Needed

It seems evident that most of the research in this area had its origin in immediate administrative problems. The major investigations surveyed need in a way which would both facilitate planning and build community relationships, studied status to find how others met problems, and followed up graduates or practices to evaluate programs.

Since need has been well proved, it is reasonable to assume technical education will expand. Further research on need might profitably go deeper. Very little is known about optimum personnel structure in industry. Studies in this direction determining the best balance of technical, engineering, and managerial personnel might provide a sounder basis for estimating need and should make for more effective utilization of talent and of educational resources.

Curriculum research is very much needed. Automation and other technological advances have been used as a basis for demanding more scientific and technical education. Research is needed to pin down these advances to specifics. Just what new skills and knowledge are essential today and what old ones are obsolete and should be dropped from the curriculum? Opinions abound, but there is no body of research on teaching methods most efficient for this age level and type of education. Likewise, present practice in technical education is almost entirely opinion-based with regard to provision of auxiliary services, organization, administration, and articulation with secondary and higher education.

Information relevant to vocational guidance in this area is virtually nonexistent. In light of the fact that most technical institutes have admission standards comparable to requirements for four-year institutions, psychological data are needed which will enable counselor and client to review the alternatives of further education on a sound basis.

The common finding that industry regarded ability to get along with others as the most important qualification of an employee was interpreted by Medsker (12) as implying a need for broader general education programs. The sharp differences between engineering colleges and technical institutes on the one hand, and liberal arts colleges and junior colleges on the other, with regard to the role and means of providing general education point up a need for research on the actual outcomes of various approaches to general education. Do more courses in general education produce the desired results, or is an integrated general education approach by a specialized faculty more effective? What are the determining factors?

In a rapidly expanding field it is inevitable that much of the research will be status research. It is, of course, necessary to find where one stands before looking beyond. However, the future value of status studies will in large measure depend upon coming to grips with the as yet unresolved problem of defining terms. Developments in technical education will depend to a considerable extent on sweeping away confusion stemming from a lack in practice of commonly agreed upon terminology.

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CHAPTER VII

Work Experience

MARY SMITH and RAY BRYAN

As THE term is used in this chapter, *work experience* occurs in connection with a school curriculum or course of study. The student spends part of his time on an actual job in a regular business or industry and attends school part time.

With the professions including only 9 percent of the total working population of the United States, it becomes evident that the school curriculum must be considerably affected by the necessity for training the remaining 91 percent of the working population. The other major vocational areas are proprietors and managers, sales and clerical workers, skilled workers, operatives, service workers, and nonskilled laborers. The schools, according to the majority of studies made between the years 1950 and 1956, have never provided work experience training for more than 10 percent of their students; yet work experience, according to these studies, is one of the most effective methods of training.

The paucity of objective studies made in this area tends to indicate that the schools are not fully aware of the problem. In the six-year period covered by this REVIEW, much of the literature written concerning work experience was of a descriptive nature. There was also much written concerning the pros and cons of work experience, but little of this material was backed up with facts obtained thru actual studies. The greatest progress in providing work experience seems to have been made in the sales and clerical fields, as indicated by the numerous articles in professional magazines in the area. The awareness of the need for work experience is slowly reaching the colleges where the few studies made report conclusions generally favorable toward work experience.

High-School Programs

Anderson (1, 2) made a study of 38 cities covering almost the entire country geographically and including cities ranging from populations less than 2000 up to cities the size of Los Angeles. Anderson found that public reaction to the work experience programs was favorable and that this increased with the length of time the programs had been carried on. The school reaction was generally favorable; many schools reported that work experience in an area frequently led to the selection of a vocation in that area. The unfavorable reaction by most schools was that work experience programs were hard to schedule.

The student reaction, using Los Angeles' 1593 participating students as a representative example, was 74 percent favorable, 16 percent undecided, and 10 percent unfavorable. Student demand for the program was steadily

increasing. One place reported a 50-percent retention of jobs after completion of school. All felt that work experience helped to bridge the gap between school and industry, gave opportunity for training under actual working conditions with equipment not found in the schools, enabled a student to earn while he learned, and allowed many to remain in school when it would otherwise have been economically impossible. One-half of the communities studied had only 3 percent or less of their total enrolment in the plan. None had more than 10 percent. Students for the program were selected on the basis of parental consent, attendance record, health, school record, job requirement, interest and ability, age, and economic necessity.

The Santa Barbara Program

Olson (19) reported on a five-year study program, begun in 1953, which was organized to find ways of helping the youth in the Santa Barbara, California, high schools to explore their own interests, aptitudes, and abilities in the various major vocational fields. School administrators wished, also, to discover how they might aid the youth in experiencing status in their communities and to provide application of the courses taught in such ways that the curriculum would have new meaning for the students. As a result of the study, which is still in progress, more students have been placed under the work experience program.

Since 1954 a new interpretation put on the child labor laws classified the youth in the program as students so that they might observe and participate in various jobs on school time without pay. Provision was also made for students who wished to work for pay. Every senior student could spend the school morning or afternoon thruout the entire school year working and observing in almost any vocation which he might enter. If students did not come up to expectations or if they found their interests were in other areas, they were moved to vocational or professional choices which were more in keeping with their abilities and aptitudes.

As a result of this program, youth gained the confidence of adult leaders in the community, students remained on nonpay jobs thruout vacations, and in the fall of 1955, 65 percent of the senior class in one high school requested work education on school time. Four out of five of these chose the nonpay type.

The Williamsport Program

Parkes (20) reported an interesting program which was set up in the Williamsport, Pennsylvania, schools. In 1952 every boy and girl in the 8000-pupil school system who was 16 years old and not yet in high school was given the option of remaining where he was in school or transferring immediately to high school. A program was worked out in the high school

to fit his needs, and after six weeks of study each student had a curriculum planned for him which fitted his particular requirements. A great deal of stress was put on work experience, and much time was spent in on-the-job training. The program served 180 students in the second year with the result that many of them did so well in their studies that they were returned to the normal curriculum. Most of them remained in school longer because of the interesting and practical nature of their curriculum. All who left after reaching the legal employment age left with at least a toe hold in a skilled or semiskilled occupation.

Other Work Experience Programs

Cambier (5), Dupree (8), and Krisch (14) reported on work experience in their own schools. In an office production class within the school, Krisch found that the students seemed to benefit more than in the formal type of training which is usually found. Dupree reported that the Sylvester High School was one of the five Georgia schools having vocational office training. Students were given one unit of credit for work in offices outside the school. Cambier told of setting up the concessions of the school in an organized effort to follow lines similar to the present trend in business management. The students were afforded a chance to gain experience in meeting and servicing customers, in bookkeeping and accounting, in cash control and banking, and in buying and inventory control. Since the program was in the school, it was easy to supervise and direct.

In a study of their own school Christenson and Bick (6) found that the work experience program kept more students in school, brought marginal students closer to the teacher, increased school attendance, gave more awareness of the value of basic subjects, aided vocational guidance, fought delinquency, aided the character education program, and provided desirable public relations.

Lemasters (15) made a study of 40 Ohio schools, of which 26 had work experience programs. Most of the work was done in the sales and clerical fields. Sixty percent of the students participating in the programs remained in the same positions following graduation. The programs met with more success in the city schools because there were more businesses available to cooperate.

As a byproduct of a study which Splaver (23) made to determine what high-school students wanted in occupational books, information was gathered regarding the work experience of a group of high-school freshmen and seniors. Of the 117 freshmen interviewed, 39 percent had had some work experience for which they were paid. Sixty-one of the 91 seniors had had similar experience. The experience was gained outside the high school with no coordination to tie it in with their courses. If this was a typical school, it would appear that the schools were missing their chance to help these students in a most important phase of their lives.

Many of the studies (1, 3, 6, 10, 13, 16, 20, 24) gave information on ways of setting up a work experience program in high schools. Opinions varied considerably on how much time should be spent, how much credit should be given, and how the program should be coordinated; very likely the differences reported reflect the fact that in the main the programs were tailored for each school's special needs.

An extensive program recently reported upon is the Pasadena Work Study Program (16). Three experimental programs were organized in the Pasadena schools to service the junior college as well as Grades XI and XII in high school. One program dealt with the sales field; a second with trades, technology, and the clerical fields; the third program was organized for students not working in jobs related to their school major. The largest group of students was classified in the third program. Standards were set up for the jobs which would be acceptable in the program, and the units of credit given varied with the amount of time put in.

Junior College Programs

Increasing recognition of the need for work experience programs was found on the junior and senior college level; however, Crane (7) found that only 57 of 248 junior colleges surveyed had work experience programs in the year 1949-50. One-half of the schools having programs had an enrolment of students ranging from 250 to 499.

Blossom (4) reported on the work experience program of Endicott Junior College. The program included 300 women working off-campus for four weeks. She found that it aided in the understanding of a vocational field, particularly because of the opportunity to see all sides of an occupation. The insights gained were of considerable value in guidance.

College Programs

Probably the senior colleges are the slowest in developing work experience programs. No study was found which would indicate to what extent the colleges have adopted such programs. There have been studies, however, indicating need. On the basis of Noble's data, Garris (10) reported that many agriculture teachers had no actual farm experience. Only eight of all the land-grant colleges in the United States required farm experience for all candidates for the Bachelor of Science degree in Agricultural Education; the requirement ranged from 10 weeks to two years. Some colleges organized a department of farm practice which taught students the basic skills before they were given actual experience. While some basic skills were important everywhere, such programs have geographic limitations: for instance, learning how to milk would be important in Minnesota while learning how to care for orchards would be of importance in California.

Bedford (3) reported what Glendale College in California had done to meet the needs of its students in the work experience field. Since a study revealed that 55 percent of the male students were employed and that enrolment was decreasing, the objectives of the program were (a) to provide means by which students could defray part of their college expenses and still graduate with their classes, (b) to assist students in making intelligent selections of lifetime careers based on tryout experiences under guidance and supervision, (c) to develop an understanding of actual job requirements in business and industry, and (d) to provide a practical program for the development of efficient work habits and constructive work attitudes. A placement committee was set up to direct the program. A maximum of 20 units of college credit, or one-third of the total number required for graduation, was allowed for the work experience. Actual experience was supplemented by a vocational guidance course which was required of all students under the program. The objective of the course was to give the students a better understanding of just what they wanted out of life and the best way to get it. The program resulted in increased enrolment, tended to equalize educational opportunities, and permitted students to work their way thru college without serious handicap as compared with those who came from the upper economic levels. It also offered valuable tryout experiences in business and industry and helped in the intelligent selection of careers.

A study by Hallisy (11) of all business teacher trainees at the Bloomfield, Pennsylvania, State Teachers College showed that 93 percent of the sophomores, 77 percent of the juniors, and 94 percent of the seniors had had some form of work experience. The percent of workers in the business fields was far higher than that of workers in other fields. Practical experience gained by the students was quite typical of office work and was related directly to the kind of vocational instruction they were preparing to give. The duration of employment periods ranged from a summer to nine months; the average was four and one-half months.

Business Programs

Illustrative of what is being done by business is the report by Sund (24) on the Elgin Watch Company program. This program was organized to create interest in the company and to provide a sympathetic bond between the employer and the employee. It began in a small way, first with only 10 girls who were carefully chosen. They were put in the stenographic department on Saturdays and worked for seven hours of the day; the other hour was devoted to teaching them how to run bookkeeping machines, key punch machines, and other office equipment and to advising them on office dress and conduct. Everyone concerned with the program was pleased with the results. The program was to be continued and enlarged the following year.

Evaluation

There is an increasing realization of the importance of work experience programs in our schools. Persky (21) surveyed 179 graduates in elementary education from New York University. Student teaching and observation were listed as the most significant parts of their training by 59 percent of the students. On an evaluation of the total curriculum, 146 of 147 graduates listed student teaching as valuable while 142 said the same thing for observation and participation.

Harlow (12) reported results from a questionnaire sent to 500 graduates of Northwestern University belonging to the classes of 1935 thru 1939 and chosen at random. One hundred and sixty of the 200 responding had had part-time work experience while in school. The jobs held had been mostly clerical or service in nature; there was usually no connection between these jobs and the curriculum followed. This evidence suggests that a work experience program would have been very beneficial.

The studies by Anderson (1), Lemasters (15), Krawitz (13), and Blossom (4) indicated that the results of the programs were advantageous to the schools, the students, and the businesses participating. Each study showed that there were a necessity and a demand for the programs to be enlarged. O'Leary and Blume (18) reported that the programs they had studied resulted in bringing the schools and the communities into a closer relationship. Teachers were better able to guide students into fields where they would be happy and effective. It was shown by Scales and Hutson (22) that work experience which was not conducted thru the schools provided many of the same benefits in character training and improved relations with the family and school.

Counselors who had a chance to go out into various occupational fields to study what these fields required answered questionnaires concerning the value of their experiences (9). All respondents indicated that they had increased their fund of occupational information; 60 percent said there had been a marked increase.

Nadler (17) reported that work experience was the student's bridge to the future. People taking refresher courses had many times been new entries into the employment field. There was apparently an unsatisfactory transition from the school to the employment field; an effective work experience program should have made the transition much easier.

Needed Research

There would seem to be a definite need for further research concerning the possibilities of work experience at the college level. Studies have shown that the need exists (7, 10), but very few studies have been made on just how such programs should be carried out.

Reports from high schools (1, 2, 16) indicated that the phases of work experience which required more study and research were scheduling,

time involved, credit, and coordination. Since work experience programs in high school are presently serving only up to 10 percent of the students, more research should be carried out to find ways to aid the other 90 percent. The Pasadena study (16) made a start in this direction, but much more remains to be done. If school administrators want to serve all students, they should be more interested in work experience programs.

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